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	1. A VIBIT WE	made to the Underwater Sound !	Laboratory, New London,
Connect	icut, 6 August	1954 to discuss infrared devel	opment activities with
respect	to voice and C	W communication devices.	
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	2. Specific in	sterests concerned the developm	ent of a cesium vapor
transmi	tting tube and	an inquiry regarding evaluation	n tests and reports of
recentl	y completed inf	frared communication systems.	<del>-</del>
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would be present for these formal tests.

the period 16 - 19 August 1954 at the Underwater Sound Laboratory. It was stated that Mr. Don Carver, BuShips, Code 853 and Joseph H. Hannigan, Code 964B

5. Tests of all available infrared equipment are to be conducted during

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Trip Report

### 6. The following equipment was viewed and discussed brisily:

## a) AN/SAC-4

The AN/SAC-4 is a 50 watt infrared transceiver capable of voice and CW modulation. It is intended for shipboard installation and weighs in excess of 100 pounds. The transmitting source is cesium vapor. The operating range was estimated at 10,000 yards and is powered by 115 volts, 60 cycles and 120 volts DC.

## b) AN/PAC-1

The AN/PAC-1 is a portable infrared voice system. The viewer has a disseter of  $4\frac{1}{2}$  and a beam width of 10 degrees. The tungsten transmitting tube is mechanically modulated and has a disseter of  $4\frac{1}{2}$  and a beam width of 4 degrees. The operating range for two AN/PAC-1 units was estimated at 5,500 yards. The viewer and transmitter are mounted in a vertical plane in a magnesium housing and weigh 14.5 pounds. The power supply is separate and consists of three Willard rechargeable batteries and a 90 bolt dry cell. The power supply weighs approximately 17 pounds. The equipment may be operated from the shoulder although a tri-pod mount is provided. An instruction manual has been prepared and is available (NAVSHIPS 92080 - CONFIDENTIAL).

# c) AN/UAT-1

The AN/UAT-1 is a 35 watt omidirectional transmitter beacon used in conjunction with the AN/PAR-2 Swimmers Helmet. This unit was not available.

## d) AN/PAR-1

The PAR-1 is a voice and Cw infrared receiver intended for use in a small boat. The dimensions of this unit are approximately 12" X 12" X 3\frac{1}{2}". This unit was the receiving device used in conjunction with a demonstration of the AN/PAC-1.

#### e) PAR-2

A pre-production model of the AN/PAR-2 was available. This unit is an infrared receiver that is worn on the head of a swimmer and nicknesses "Beanie". (A technical manual is available as NAVSHIPS 31837 - CONFIDENTIAL).

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- The AN/PAC-1 is the U. S. version of the German LICHTSPRECHEM, a 1937 model of which was seen at the U.L. This equipment is described by W. S. Hurford and J. R. Platt in the Journal of Opticians Society of America, Volume 30, 85, 3, Pages 253 to 266. Reprints may be obtained from the American Institute of Physics, 57 East 55th Street, New York 22, New York.
- (increase its range.
- h) A recently developed communications device for symmers was described. This equipment consists of a transducer and amplifier, about the size of a package of eigerates, head-phones and a lip microphone. It was explained that the normal maxisum range of communication between waterborn swimmers is 20 by shouting but that swimmers intercommunication range was extended to 200 feet with the unit which is referred to as the "Buddy Phone". Homenclature has not been assigned.

### . Demonstration

The AN/PAC-I was set up in a small andicerium and the tradesliced been was founced off the back of the furthermost seat. Voice communication was received with the PAR-I and the wrist receiver. Reception was excellent, the range was approximately 120 feet. (i.e. the equipment worked.)

Considerable additional information was gained on infrared bechanges and the feasibility of developing equipment of reduced dimensions for agent communication with a 2½ mile rexister range is indicated. A report on these talks will be left to a future report in the interests of disseminating unformation regarding the formal tests during the week of 16 August.

RED-EP/CEM/ed 13 Aug '54

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